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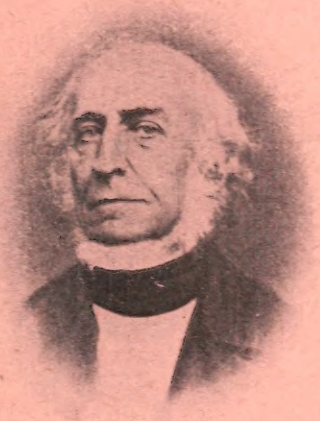

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ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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Address at the Dedication of the Entomology and Zoology Building of the Massachusetts Agricultural College, Nov. 11, 1910.*

By L. O. HOWARD, U. S. Dept. of Agriculture, Washington, D. C.

WHEN Professor Fernald began to teach entomology in the Maine State College at Orono, in 1872, there was only one other teacher of the subject in the United States, and that was Dr. Hagen, at Harvard, who had only an occasional student. Of earlier attempts to teach entomology on this side of the Atlantic there is little of record. W. D. Peck lectured at Harvard in the earlier years of the last century, and after 1831, T. W. Harris, while librarian of Harvard, had a private class in entomology, meeting one evening a week, and on Saturday afternoons went with his class in good weather on a ramble. Colonel Higginson writes: "Doctor Harris was so simple and eager, his tall spare form and thin face took on such a glow and freshness; he dwelt so lovingly on antennæ and tarsi and handled so fondly his little insect martyrs, that it was enough to make one love this study for life beyond all branches of natural science."

* Reprinted from *Science* for December 2, 1910.

Teachers of natural history of those days had to cover botany, zoology, geology, human physiology, chemistry and natural philosophy. Collections and apparatus were practically non-existent. The publication of Harris's "Insects Injurious to Vegetation" in 1841, classic though it was, aroused no great interest in the study of insects, and it remained for Packard's "Guide to the Study of Insects," published in Salem in 1869 and written by a young and enthusiastic worker inspired by Agassiz's training, to place entomology in America on a footing so that the subject could be competently studied and taught. The influence of Louis Agassiz in fact, perhaps even more than is generally realized, was enormous in the development of interest in natural history in America, and entomology no less than the other branches of the subject felt its stimulating effect. Moreover, the Smithsonian Institution in those older days under Joseph Henry did much by the publication in its "Miscellaneous Collections" of the works of Morris, Osten Sacken, Loew and Le Conte to help the labors of the earlier group of workers.

So we find the elder Fernald beginning to teach entomology at the Maine State College in 1872, and a year later J. H. Comstock began to teach it at Cornell. Fernald, however, was professor of natural history and he had to teach all sorts of things, while Comstock was confined to entomology and invertebrate zoology. Thus, while Fernald was one of the early teachers of entomology, Hagen was really the first professor of this subject with Comstock as second. But it is not my plan to discuss precedence in this direction. I wish to show how recent are the beginnings of the study and how rapidly it has advanced. As it happens, I was Comstock's first student, and we began to work together in a little cramped room in the autumn of 1873, with little material, few books and a poor microscope for our equipment. At the Agassiz Museum, Hagen had his excellent library and good collection, and he had Crotch and Schwarz and Hubbard, and a little later, Samuel Henshaw working with him. Fernald was working single-handed off in Maine. A few economic entom-

ologists were busy—Fitch in New York, Riley in Missouri, Le Baron in Illinois and Glover in Washington. The systematic workers and those who studied the habits of insects were more numerous—Le Conte, Horn, Osten Sacken, Lintner, V. T. Chambers, E. T. Cresson, S. H. Scudder, W. H. Edwards and his colleague T. L. Mead, Henry Edwards, A. R. Grote and his colleague Coleman T. Robinson, P. R. Uhler, H. F. Bassett, R. H. Stretch, F. G. Sanborn, S. S. Rathvon, Cyrus Thomas, H. C. McCook, G. R. Crotch, H. Behr, C. Zimmerman, George Dimmock, C. S. Minot, P. S. Sprague, F. Blanchard, C. A. Blake, Edward Norton, H. Shimer, T. Meehan, E. D. Cope, E. P. Austin, J. Behrens, Jas. Ridings, A. J. Cook, W. V. Andrews, Edward Burgess, L. F. Harvey, F. H. Snow, G. Lincecum, J. H. Emerton, Mary E. Murtfeldt, G. M. Dodge, C. R. Dodge, Thomas G. Gentry, H. K. Morrison, A. S. Fuller, E. L. Graef, and, across the border in Canada, Abbé Provancher, William Saunders, Rev. C. J. S. Bethune, William Couper and E. Baynes Reed were about all.

And it must be remembered that nearly all of these men had had no training and were scientifically untaught; nearly all were engaged in professions or in business, and that entomology was but a side issue and not the sole interest of their lives—in fact with many of them it was simply an amusement, a fad. But I do not intend to detract from the value of their work. They and their few predecessors laid a strong systematic foundation for the work which has been done since, and for that which is still to come. It should be pointed out, however, that, systematically speaking, whole groups of the North American entomological complex were unknown. The Coleoptera and Lepidoptera and certain families in the Diptera and Hymenoptera had been studied by these men, but a field of unknown greatness remained unexplored.

Something must be said also of the influence of the unusual personality of some of these men in attracting others to the study. I have in mind especially Rev. J. G. Morris and Henry Ulke, neither of whom is mentioned in the list; Morris because at that period he had stopped publishing and Ulke

because he had not published at all. Both of these men, rarely attractive, lived long, Morris dying in 1895 at the age of ninety-two and Ulke in the present year at eighty-nine, and both of them undoubtedly made entomologists of others by their personal charm and enthusiasm.

There were then in 1873 three teachers of entomology, two of them just beginning, three state entomologists, one of them (Fitch) already at the end of his work, a government entomologist, who, on account of his mental make-up, was adding little to the progress of the science, and a small body of amateur entomologists engaged in all sorts of occupations, but whose systematic work as a whole compared favorably in quality with that of the workers of other countries. The *Canadian Entomologist* had been started, and the American Entomological Society was publishing good entomological papers.

At the present time, after thirty-seven years, what a change is to be seen! In the place of the few score self-trained entomologists, there is now an army. The American Entomological Society is still in existence, and publishes, in addition to its *Transactions,* an admirable entomological journal, *Entomological News.* The Entomological Society of Washington has been founded, with its quarterly *Proceedings* now well along in its twelfth volume. The Albany Entomological Society, the New York and Brooklyn societies, the California Entomological Society, the Society of Southern Economic Entomologists and the great Association of Economic Entomologists with its list of foreign members in all parts of the world and its universally-read *Journal of Economic Entomology,* and, latest of all, the Entomological Society of America with its large list of members and fellows and its entirely competent annals and its representation the present year at the first International Entomological Congress—all have sprung into healthy and progressive existence since those days.

In place of the two active state workers in economic entomology, Le Baron in Illinois and Riley in Missouri, and of the single government entomologist, there is now in practically

every state in the union an efficient entomological staff composed of trained men; and at Washington there is a corps connected with the Bureau of Entomology comprising six hundred and twenty-three individuals, of whom one hundred and thirty-one are trained entomologists. In certain states, notably California, there are even county and district entomologists. It is safe to say that in 1873 there were spent by states and the general government for entomological work not to exceed ten thousand dollars a year. On the other hand, the amount spent by states and the general government for this work at the present time much exceeds one million dollars a year. As late as 1877, immediately following the disastrous invasions of the Rocky Mountain locust into Colorado, Kansas and western Missouri, and which brought about a loss certainly equaling two hundred millions of dollars and reduced a large population to the verge of starvation, it was with the utmost difficulty that Riley and his colleagues were able to secure from congress an appropriation of eighteen thousand dollars to start the United States Entomological Commission on its work of investigation of the causes of the outbreak and the remedies to be used in case of future invasions. A conference of the governors of the various western states and territories asked congress for a commission of five experts and an appropriation of twenty-five thousand dollars, but congress scaled this down to three experts and an appropriation of eighteen thousand dollars. Within very recent years, however, congress has appropriated almost without discussion such large sums as two hundred and fifty thousand dollars for the investigation of the cotton boll weevil and three hundred thousand dollars for the investigation of the gipsy moth and the brown-tail moth, while New Jersey has spent more than a hundred thousand dollars on the mosquito work, and Massachusetts alone more than a million on the gipsy moth, the latter sum covering the work of a number of years. It is safe, in fact, to estimate that there are in the neighborhood of five hundred scientifically trained entomologists holding official positions in this country at the present time, as against five thirty-seven years ago.

That with our rapidly increasing population a certain part of this growth should have occurred would have been quite to be expected, yet no such growth has occurred elsewhere, and we must search for other explanation than the one of normal increase. The first great impetus came with the organization of the state agricultural experiment stations in the spring of 1888 under the act of congress known as the Hatch act. In a short time twenty-eight experiment station entomologists were appointed. It was difficult to find the right men, but Fernald, Comstock and A. J. Cook had been lecturing to slowly increasing numbers of students, and the places were gradually filled and nearly all of them well filled. Most of the appointees found that they had to do much teaching work, and they had to build up libraries and collections, so that there was little time for research work; but there were twenty-eight teachers thrown into the field, for the most part young and enthusiastic men, and through their efforts began a sudden increase in interest in entomology, and year after year their graduates and those of other teachers who had been added to their number have rapidly increased the number of working entomologists and of those possessing a trained interest in the study.

Shortly after these newly appointed experiment station workers took their places and began their labors, the gipsy moth was discovered in New England. It is due to Mrs. Fernald's accurate knowledge of the Lepidoptera that this insect was identified with the destructive European pest as early as it was; and this determination at once made it evident that strenuous efforts must be made to check the spread of the species. The rapid increase of this pest and the remarkable work carried on in the state of Massachusetts during the next ten years attracted the minds of the people of the country towards economic entomology as almost never before.

A few years later the San Jose scale was discovered in the eastern United States. The tremendous effect of the spread of this most injurious species upon the popular estimation of the value of entomological knowledge can hardly be overesti-

mated. This spread alone is responsible probably for more legislation in this country and in other countries than all the other features of entomology combined. The San Jose scale literature published in the last sixteen years covers hundreds of thousands of pages, and hundreds of thousands of dollars have been lost through the work of the insect. But through the operation of new state laws many additional entomologists have been employed, and through their work millions of dollars have been saved.

The discovery in 1894 by Smith, Kilbourne and Salmon that Texas fever in cattle is carried by a tick, the discovery by Ross in 1898 that malaria is carried by certain mosquitoes, the discovery by Reed, Carroll and Lazear in 1900 that yellow fever is carried by a mosquito, and the later numerous discoveries of the role of insects in the carriage of diseases of man and animals have still further intensified public interest in entomology and have shown anew the importance of entomological education. Here economic entomology has touched a new side of human interest; it is the health of man and not the preservation of his property that is concerned, and the interest, therefore, has become a more vital one.

In 1894 the Mexican cotton boll weevil was discovered within the territory of the United States, and its spread to the north and east year after year has presented an enormous problem in economic zoology. The tremendous damage it has done and the fears it has aroused in other cotton-growing countries have threatened a disturbance in the balance of trade for the entire world. The investigation which has been carried on has been liberally supported by the general government, and many trained men have been employed in the work.

The present commanding position which the United States holds in entomology and the wide-spread interest felt in all entomological questions, the increased support of the government in this direction, and the increased attention given to education in economic zoology, are then mainly due to the establishment of the experiment stations, to the advent of the gipsy moth, to the spread of the San Jose scale in the east, to

the discovery of the carriage of disease by insects and to the remarkable and disastrous spread of the cotton boll weevil throughout the south. There are many other causes, such as the recent very great development of interest in the practical handling of the parasites and predatory enemies of injurious species, but these need not be detailed at this time. I have said enough perhaps to explain why there are so many trained entomologists at present and why the agricultural colleges are training so many more; and that brings us to the immediate question of the training of economic zoologists.

In an address on "The State and Zoology" given at Baltimore in December, 1900, I called attention to the fact that university teachers should make a study of the markets for the brains and training of their students; they should study the conditions of those markets and their needs. I showed that the men in charge of university departments of scientific work should keep closely in touch with the government work along similar lines; that they should be encouraged to do so by the government; that the government should employ their services where they can be of use, and that they themselves should be able with the intimate knowledge acquired by official association or by close investigation of government work, to lay out lines of study which will fit their students to take a hand in government work. This, I am glad to say, has been done by several of the teachers of zoology in the agricultural colleges, and by none more successfully than by the Fernalds, of the Massachusetts Agricultural College. The men they have turned out have taken good rank among the experts of the state and government departments. In the bureau of which I am the chief I have secured some of our most valuable workers from this college. Among them I may mention A. F. Burgess, W. E. Hinds, W. A. Hooker, A. W. Morrill, E. A. Back, H. M. Russell, H. P. Wood, J. H. Hyslop, F. H. Jones, F. D. Couden, C. E. Hood, F. A. Johnson, S. S. Crossman, C. W. Hooker and A. I. Bourne; while among the others who have achieved prominence are Dr. E. P. Felt, state entomologist of New York; Mr. A. H. Kirkland, the former sup-

erintendent of the gipsy moth service of the state of Massachusetts; Mr. C. P. Lounsbury, the entomologist of South Africa; Mr. H. A. Ballou, the entomologist of the British West Indies; Mr. R. I. Smith, entomologist of the state of North Carolina; Mr. R. A. Cooley, the entomologist of the state of Montana; Mr. H. C. Gowdey, the entomologist of the African colony of Uganda.

These lists mean an excellent preparation. They mean that the Fernalds have studied the market for the brains of their students, and that they have turned out men fitted in every respect for their pursuit. I have always felt confidence in men coming from this laboratory, and that the work done by this department has been recognized in the erection of this building is a source of gratification to every one connected in any way with the men here or with the men who have gone out from here.

But after all this is only one of the evidences of the spread of education in this direction. Out in California four years ago the university at Berkeley erected a building exclusively for the department of entomology. I visited it only a month ago, and found Professor Woodworth surrounded by his corps of assistants, with the class rooms full of eager students and a general air of bustling energy and interest in the work. At Cornell, where Professor Comstock began, as I have shown, thirty-seven years ago in a small room with no assistants and no equipment, there is now a large department occupying spacious quarters in the new agricultural building erected by the state, with extensive libraries and large collections and a corps of six professors, including Professor Comstock himself. Although the department is still that of entomology and invertebrate zoology, the entomology is by far the most important, and every one of the six professors is teaching entomology. There are also six assistants, of whom four are in biology, one in insect morphology and one in general entomology. The present year there is an enrollment of 565 in the various courses. This includes a registration of 375 in general biology and 190 in purely entomological courses.

In Illinois Professor Forbes has a building devoted entirely to entomology. It is not a very large building, but it is sufficiently commodious and the same interest in the work is shown. In strictly entomological courses this year there are 85 students, of whom 13 are graduate students working in advanced courses. The instructors are—one professor, one assistant professor and two laboratory assistants. Excellent courses are given, and good men are being turned out.

Out in Nebraska Professor Lawrence Bruner started in the autumn of 1888 with three students. During the past year (1909-10) there were 160 students in the first semester and 142 in the second semester in the school of agriculture, while in the college work there were 21 students throughout the year. At the date of present writing there are 23 students registered in college courses, while the school of agriculture has not yet started. Professor Bruner has one assistant professor and a laboratory instructor.

Such information as this might be continued for pages. This is sufficient, however, to indicate the advances that have been made and the sound condition in which we find instruction in economic zoology being carried on at the present time. It may be well to suggest here that if any criticism is to be made of the training that economic zoologists are receiving in our institutions it is that sufficient stress is not laid upon the necessity of learning the methods of field work. A young man coming from a university or an agricultural college knowing his insects well and well fitted to teach, is at a great disadvantage in going into practical work if he has had no field experience, and also if he does not understand agriculture, horticulture and the most important art of meeting and handling men.

It will appear from what has been said that the Massachusetts Agricultural College has borne her full share, and the Massachusetts Agricultural College in this connection means Professor Charles H. Fernald, later with his son Henry. He came here in 1886, just before the founding of the agricultural experiment stations. His published works, both in pure-

ly scientific and economic directions, have stamped him as of the first rank. His work in connection with the magnificent efforts of the state of Massachusetts to control the gipsy moth and the brown-tail moth has been of the soundest character. The affection and respect shown for him by his students is indicated almost daily by those who have come to Washington, and is easily understood by one who, like myself, has been more or less closely associated with him for thirty years. I shall never forget the summer of 1880, when he and Mrs. Fernald spent some time in Washington working with Professor Comstock, who was at that time chief of the Division of Entomology, I myself being his assistant. Professor Fernald was a constant inspiration and he was also a constant delight on account of his overflowing humor. At that time pedlars and mendicants of different kinds were allowed access to the rooms, and it was a standing joke of the Professor's, when the door opened and one of these men came in, to jump to his feet, to appear to recognize him, shake his hand cordially, ask after his wife and children and the old folks at home, which almost invariably so confused the incomer that he turned around abruptly and left the room.

I understand that he is to retire now. I know of no one who has made quite so good a record, viewed from every point. A number of years ago I was riding with him along a country road in eastern Massachusetts, and he said to me, "Howard, I have been thinking about myself and of the little I have done, and I wonder whether after I shall have gone people will think of me as a systematic entomologist or rather as an economic entomologist." And I replied instantly, "You forget probably the biggest work you have done and the best work, and that is as a teacher." And is it not true? The memory of Professor Fernald will live after he goes, both as a systematist and as a strong economic entomologist, but, greater than either, as a teacher; and this building will be a visible monument to his work as long as it shall stand. May he live many more years to know and to enjoy the reputations which are being made and which shall surely continue to be made by the men he has taught.

A new Argynnis and a new Parnassius (Lep.).

By Henry Skinner, M.D., Philadelphia.

Argynnis sakuntala n. sp.

This is a red fulvous species belonging to the *rhodope, zerene, monticola* group.

In the male the black markings on the upper side of the wings are not as intense a black as in *rhodope* and the red fulvous of the wing is not so deep. The under side of the primaries is marked as in *rhodope* but the ground color is not so intense or dark in color. There is a decided buff space on the secondaries below, between the sub-marginal markings and the row of large spots crossing the wing from the costa to the inner margin. In *rhodope* this space is a dark red fulvous or ferruginous. The spots crossing the wing number seven and they are larger than the corresponding spots in *rhodope* and only edged with black on their inner side. The submarginal crescents are not silvered as in *rhodope*. The basal area is brick red in the form being described and deep red fulvous in *rhodope*. The female is similar but lighter in color. In this sex the submarginal crescents are slightly silvered.

Described from four males and one female.

Habitat.—Ainsworth, B. C., Aug. 13, 1903, Rev. G. H. Findley; Kaslo, B. C., July 7, 1890, J. W. Cockle; Laggan, Alberta, T. E. Bean.

Type Locality—Kaslo, B. C. The specimens, excepting those from Laggan, were kindly submitted for study by Dr. C. Gordon Hewitt, Dominion Entomologist. The Alberta specimens and the type are in the collection of the Academy of Natural Sciences, of Philadelphia. Owing to the fact that the above mentioned material in conjunction with a large series of *rhodope* has been made available for study, it seems advisable to name this form. What relation it bears to *rhodope* in nature can't be foretold, but it is sufficiently distinct to call attention to it in the hope that future study will establish its true relationship.

Parnassius immaculata n. sp.

Male. Expands 1.25 inches. Primaries marked as in *Parnassius clodius*. Secondaries devoid of spots, the only marking is formed by the black scales on the inner margin and on the inner side of the discoidal area.

Described from one specimen taken at the Old Faithful Geyser, Yellowstone Park, Wyoming, by Mr. W. Judson Coxey, and kindly presented by him to the Academy of Natural Sciences, of Philadelphia. What relation this bears to *clodius* I am not prepared to say. Additional material and study in its habitat will be necessary to solve the problem.

Two new Gall Midges (Dipt.).

By E. P. Felt, Albany, N. Y.

The two West Indian species described below were reared by Mr. W. H. Patterson, of the School of Agriculture, St. Vincent, and recently sent to the writer for determination.

Asphondylia vincenti n. sp.

This species was reared from the fruits of *Jussiaea linifolia* and *J. suffrutiosa,* at St. Vincent, W. I.

Male. Length 1.75 mm. Antennae nearly as long as the body, sparsely short-haired, dark brown; 14 sessile segments, the fifth with a length about five times its diameter; circumfili distinct, very tortuous. Palpi: first segment irregularly oval, with a length over twice its diameter, the second slender. nearly three times the length of the first. Mesonotum a nearly uniform slaty brown, the submedian lines sparsely haired. Scutellum fuscous yellowish, postscutellum darker. Abdomen sparsely haired dark brown. Wings hyaline, costa light brown, subcosta uniting therewith just before the basal half, the third vein at the apex of the wing, the fifth just beyond the distal third, its branch just before the basal half. Legs mostly a variable fuscous yellowish, the tarsal segments being darker, except the yellowish brown tibiae and first four tarsal segments of the posterior legs; simple claws rather slender, strongly curved, the pulvilli as long as the claws. Genitalia; basal clasp segment short, greatly swollen; terminal clasp segment short, swollen, bidentate apically; dorsal plate divided, the lobes narrowly oval and thickly setose apically; ventral plate small, apparently bilobed.

Female. Length 2 mm. Color characters nearly as in the male. Antennae: the fifth segment with a length about five times its diameter, the 12th with a length ¼ greater than its diameter, the 13th a little shorter. the 14th flattened, subglobose. Palpi: the first segment with a length nearly three times its diameter, the second slender, ½ longer; posterior tibiae and first four tarsal segments markedly lighter than in the male. Ovipositor when extended about as long as the body, the acicula slender, acute; dorsal pouch moderate sized, the lobes thickly setose and narrowly rounded apically.

Pupa. Length 2 mm. Oval, stout, yellowish brown; cephalic horns moderately long, stout, the inner oblique margins finely serrate; antennal cases extending to the first abdominal segment, the wing cases to the fourth and the leg cases to the sixth. Just below the base of the antennae and on the venter there is a median, triangular, chitinous pro-

cess. and a little behind that a bidentate, chitinous process with a minute median tooth. Pupal skin thickly set with chitinous points or corrugations. Abdominal segments each with the dorsum ornamented with two sparse, transverse rows of stout spines, these becoming irregular on the terminal segment, the apex being marked with a group of two or three divergent, sublateral spines.

Larva. Length 2 mm. Rather stout, white, distinctly segmented; head extremely broad. only the tips of the slightly protuberant mouthparts being fuscous; antennae short, extremely minute, the whole greatly obscured by the large, strongly chitinized breastbone, which latter is broad, anteriorly, quadridentate, being divided by a median incision into two groups of minor teeth; shaft rather indistinctly chitinized and supported by submedian, chitinous, rounded lobes; skin coarsely shagreened.

Type Cecid a2118, N. Y. State Museum.

Hyperdiplosis eupatorii n. sp.

This species was reared from a green, conical gall with a length of about 4 mm. and a diameter of 1.5 mm., on the upper surface of the leaves of *Eupatorium,* the insects pupating within the deformity. This form is provisionally referred to *Hyperdiplosis,* because it agrees therewith in the triarticulate palpi, the reduced circumfili and the deeply and roundly excavated ventral plate. The antennal stems of the typical *Hyperdiplosis* are more produced and the claws more strongly bent than in this West Indian form.

Male. Length 1.1 mm. Antennae ½ longer than the body, thickly haired, fuscous yellowish; 14 segments, the fifth having the basal portion of the stem with a length ½ greater than its diameter, the distal part with a length 2½ times its diameter; basal enlargement subglobose, a sparse subbasal whorl and a subapical circumfilum, the loops short and reaching only to the middle of the stem; the distal enlargement with a length ½ greater than its diameter, a scattering whorl of setae, subbasal and subapical circumfili, the loops of each short, those of the distal filum not extending to the tip of the segment; terminal segment having the distal enlargement subcylindric, with a length 2½ times its diameter and a stout, finger-like process apically. Palpi; first segment short, irregular, the second with a length three times its width, the third nearly twice the length of the second, more slender. Mesonotum light brownish red, the yellowish submedian lines sparsely haired. Scutellum and postscutellum yellowish. Abdomen yellowish red, the fifth to seventh segments yellowish; genitalia reddish. Wings hyaline,

costa light brown, subcosta uniting therewith near the basal third, the third vein well beyond the apex, the fifth just before the distal fourth, its branch near the basal half. Halteres whitish transparent. Legs a nearly uniform fuscous yellowish, the simple claws slender, slightly curved, the pulvilli shorter than the claws. Genitalia; basal clasp segment long, stout; terminal clasp segment rather long, stout, irregularly curved; dorsal plate broad, broadly and roundly emarginate, the lobes irregularly rounded, sparsely setose; ventral plate long, broad, broadly and very deeply emarginate, the lateral angles rather stout, finger-like, setose apically; style long, stout, broadly rounded distally.

Female. Length 1.5 mm. Antennae nearly as long as the body, sparsely haired, dark fuscous; probably 14 segments, the fifth with a stem 1-3 the length of the cylindric basal enlargement, which latter has a length about three times its diameter. Palpi: first segment rather stout, with a length twice its width, the second a little longer, more slender, the third ¼ longer than the second. Coloration nearly as in the male, except that the abdomen appears to be deep red. Ovipositor short, stout, when extended with a length only about 1-3 that of the abdomen; terminal lobes narrowly elliptical, with a length three times the width, rather thickly and coarsely setose.

Pupa. Length 2.75 mm. Yellowish white; cephalic horns stout, yellowish brown; thorax with a yellowish cast, thoracic horns rather stout, curved; antennal cases extending to the first abdominal segment, wing cases to the third abdominal segment, the leg cases to the sixth; abdomen whitish, each of the segments dorsally with a short, transverse row of two to five stout, chitinous spines, the posterior extremity apparently unarmed.

Type Cecid a2116, N. Y. State Museum.

TIMETES.—In rearranging the American Rhopalocera in the collection of the Academy of Natural Sciences of Philadelphia recently, I became interested to know whether one or two of the red species of *Timetes* were found in the United States. I found that we only had one authentic specimen from the United States and it was taken by Mrs. Slosson at Biscayne Bay, Florida. This specimen proves to be *T. peleus* Sulz. (*petreus* Cramer). The other species in our lists is *eleuchea* Hubn, and it is said to have been taken in Texas and Florida. It is a species found in Cuba and would be likely to be also found in Florida. It is not recorded from Mexico as far as I am aware. *Peleus* and *eleuchea* are closely related and it is likely that the two have been confused. Exact records for these insects are desirable as well as exact identifications so that we may determine whether we are to list both species or only one. I will be pleased to identify any material and would also be glad to have exact data of correctly determined specimens.—HENRY SKINNER.

Notes on Tyloderma foveolatum (Say) (Col.).

By A. A. Girault, Urbana, Illinois.

On June 1, 1909, at Centralia, Illinois, along a fence around a meadow on a farm there were found in a tangle of weeds an occasional clump of evening primrose (*Oenothera biennis* L.), every plant in which had been attacked by this common weevil. Eggs were then very abundant; thus on a random plant sixty-seven egg-scars were counted. The eggs have the following characters:

Length, 0.80 mm.; width, 0.65 mm. Short-oval to oval; surface covered with a greyish, deciduous substance not unlike a coating of thin sugar and which is opaque and without sculpture. When this is rubbed off, the surface of the egg is polished yellow, with no marked sculpture but slightly coriarious or like the surface of some leathers. Soft, pliable, easily crushed. Inconspicuous. General color greyish yellow; when seen in its natural position, the upper side (and also the lower) is slightly flattened. Deposited singly. When examined with transmitted light, the egg is liquid yellow or amber, opaque centrally; this color persists until hatching. The pruinose coating is easily removed by gently rolling the eggs between the fingers. The micropyle is not conspicuous.

Several females were observed laying eggs; the manner of doing this is extremely interesting. In the cases observed the males were not present. The mother weevil faces toward the top of the plant and takes a firm hold. She then proceeds to eat out of the stem of the plant a quadrate or oval cavity, making it about a half of a millimeter deep. When this is completed, she turns about, fits the end of the abdomen into the cavity and places an egg. Then assuming her former position by turning about, she advances, breaks the skin of the plant with her beak and peels a short strip of it down to the cavity and tucks it over the egg; this is repeated a number of times. Then she commences to peel off in the same manner longer strips from above and to one side of the cavity; these longer strips are peeled down as far as the bottom end of the egg cavity, bent over it and packed with the beak around the egg. Finally, she turns about, after crossing over the nidus,

and commences to peel the long strips from the opposite direction, pulling them up as far as the top of the cavity, bending them back over it and packing them in and around the egg as formerly. In this manner, at the end, she has the egg securely protected by a closely kneaded and interwoven network of plant tissue which becomes conspicuous by being in the center (axially) of a well-defined, denuded area and also because it is convex. The whole operation may require from forty-five to seventy-five minutes, or perhaps on the average about an hour. This method of protecting the egg is certainly ingenious.

The following general notes were recorded: On June 20, 1909, females were still laying eggs. To show the comparatively enormous number of these which a single plant may receive, two random plants were examined on this date. In the case of the first, the main stem bore 204 egg-scars and three branches, 22, 13 and 28 respectively, a total of 267. The main stem of the second plant bore 97 egg-scars and its three branches, 7, 7 and 4 respectively, or a total of 115. This means in the case of the main stem that not many areas occur which are not entirely covered with the nidi. Most of those occurring on the branches faced inward or toward the main stem.

June 28, a female accompanied by its mate, riding upon its back, was observed making an egg-cavity and also a similar pair was observed at the same time engaged in completing a nidus after deposition; the males were passive in both instances. By this date, the adults were less common, the eggs, however, still commonly found in the plants; the larvae were more common, perhaps, than the eggs.

Two weeks later (July 15), adults were still present, engaged in oviposition, though noticeably less abundant. The majority of plants now opened for examination have their pithy interiors, especially near the ground, hollowed out and filled with brownish frass and debris, like moist ground cloves, those larvae which are full-grown at this time (6.25 mm.) being buried within the pith and partly concealed by the frass. Far-

ther up the stem, the hollowed-out channel gradually narrows, widening occasionally for some older larva (we may infer that first oviposition is done near the surface of the ground, later the eggs placed higher up on the stems), so that half way up the stem of the plant, merely the narrow, oblique channels of the smaller larvae are usually present at this time, none of which lead directly from the nidus to the pithy center of the stem but instead are more or less diagonal and curved, sometimes irregular or tortuous. No pupae have been found as yet. The larvae were, of course, in various stages of development.

On August 7, a badly infested plant taken from the field and examined contained full-grown larvae and also pupae. No adults have been noticed since the fifteenth of July. No other notes were obtained.

It is easily inferred that but a single generation of this weevil occurs during a season, the adults emerging in the late summer and early autumn and without attempting reproduction, hibernate. The next spring, they feed and mate, then continue to lay eggs for about two months, and in course of about a month and a half after the first eggs the adults may commence to emerge, continuing for a month or so. At Butler, Ill., eggs were found on July 16, 1910. Larvae, then, were in all stages of development. Mr. E. A. Schwarz, U. S. N. M., kindly authoritatively identified the specimens.

A NOTE ON CHLAMYS PLICATA FABRICIUS.—This peculiar chrysomelid was abundant on wild blackberry plants at Centralia, Ill., during 1909. These notes were made concerning it: Larvae present during June; first pupa found in the larval case attached to the stem of a weed, two feet up from the ground, on June 28. The first beetle emerged from pupae kept in confinement but collected outdoors, on July 7 to 9. On July 19, 1909, 10 beetles which emerged a week and a half earlier were transferred to a breeding-cage containing fresh foliage of blackberry: although they lived for at least a month, they did not reproduce. They had been well attended to as regards food.—A. A. GIRAULT, Urbana, Ill.

New American Cleridae, with notes on others (Col.).

By A. B. Wolcott, Chicago, Ill.

The material forming the basis of the present article was recently received from Prof. H. F. Wickham, by whom it was collected and to whom my thanks are due for having generously placed in my hands for study all his unique and most valued specimens. Nearly all the species herein described as new are forms differing greatly from their nearest allies and should prove of easy recognition.

CALLOTILLUS gen. nov.

Body elongate, moderately convex, winged. Labrum short, transverse, truncate; eyes small, finely granulate, internally deeply emarginate; last joint of maxillary palpi subcylindrical, of labial palpi securiform; antennae 10-jointed, joint one moderately large; joint two small, suborbicular; joint three elongate, triangular, longer than joint one; joints four to nine triangular, much larger than preceding joints, as broad as long; joint ten compressed, longer than the two preceding joints together, obtusely rounded at apex.

The species for which this genus is erected is *Clerus*-like in form. The structure of the antennae recalls both that of *Tillus* and *Monophylla*. The third joint of the antennae is elongate triangular, but much narrower and more elongate than the succeeding joints. The legs are slender and moderately long. The tarsi, five joints of which are visible from above, are scarcely one-half as long as the tibiae; they are feebly dilated and joints two, three and four are lamellate; the claws are bifid, the inner division slightly shorter than the outer portion and furnished with a strong tooth at base. Five segments of abdomen visible.

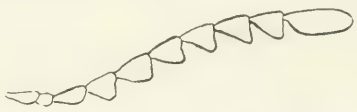
The structure of the tarsi and the antennae bring this genus into the group Tillini, where it is best placed between *Monophylla* Spin. and *Tillus* Oliv.

Type of the genus is the following new species:

Callotillus eburneocinctus sp. nov.

Rufous, subopaque; meso- and metasternum rufo-piceous; abdomen black, shining, posterior margins of ventral segments pale; antennæ

pale testaceous; elytra with a narrow, slightly recurved, elevated, median fascia pale yellowish, apical half of elytra blue black. Head including the feebly prominent eyes not wider than the thorax at apex, moderately clothed with whitish pubescence, rather finely very densely punctate. Thorax longer than broad, much narrower at base than at apex, apical margin arcuate, sides broadly rounded to behind the middle, thence gradually convergent to base, less densely but a little more coarsely punctured than the head, clothed with short, recumbent, grayish pubescence, and in apical half with long erect black pilosity which



Right antenna of *Callotillus eburneocinctus* n. sp.

is dense each side of middle, forming a large indefinitely limited rounded spot. Elytra broader at base than the thorax at widest part, sides parallel in basal half, behind this arcuately broadened then narrowed to the conjointly rounded apices, humeri moderately prominent, each elytron strongly tuberculate at base midway between scutellum and humerus, the tubercles clothed with erect black pilosity, basal half of elytra rufous, clothed with sparse black pilosity, finely densely punctate, apical half blue black, densely clothed with short grey pubescence with some longer erect black hairs intermixed, as densely but more coarsely punctate than basal half, a narrow, slightly elevated somewhat recurved, pale yellow median fascia attains the flanks but not the suture. Body beneath and abdomen sparsely, finely punctate, clothed with sparse whitish pubescence. Legs moderately clothed with whitish hairs. Length 5 mm.

One specimen. Key West, Florida. Type in collection of Prof. Wickham.

Cymatodera delicatula Fall, Canad. Ent., xxxviii, 1906, p. 113.

A specimen taken at Tepehuanes, Durango, Mex., I refer to this species with slight doubt. It differs in no discernible structural character from the typical form from Lower California. The color in the example before me is, however, so different from that of the Lower Californian form that no doubt they would be considered distinct were specimens of the species from the type locality not before me.

In the Tepehuanes specimen the body beneath is pale testaceous, the head entirely black, the thorax as in the type, but

the elytra are black with a much narrower ante-median fascia, which is slightly interrupted at the suture; the apices of elytra not pale. The specimen is 3.5 mm. in length.

Cymatodera turbata Horn, Trans. Amer. Ent. Soc., xii, 1885, p. 151.

This species was also taken at Tepehuanes, Mex., by Prof. Wickham. The specimen is typical in every respect with the exception of a very slight infuscate cloud at extreme apices of elytra. This species has not been recorded as occurring elsewhere than in Texas, if we exclude a Panama record of a species doubtfully determined as *turbata*.

Cymatodera comans Wolc., Publ. Field Mus. Chicago, vii, 1910, p. 351, pl. 6, f. 14-16.

Two male specimens of this species have been sent me by Prof. Wickham since the description was published. Both examples were taken at Salton, Cal., August 20, and form an interesting record as they were found at 265 feet below sea level. A female from Peach Springs, Ariz. (Wickham), is considerably smaller than the type, being but 7.5 mm, in length. A male from Yerington, Nev. (Baumberger), is of the same size as the female from Peach Springs. The present known distribution of the species is Utah, Texas, Arizona, California and Nevada.

Cymatodera bipunctata Gorh., Biol. Centr.-Ameri., Col. III, 2, 1882, p. 135, pl. vii, f. 16.

A specimen of this very rare species labeled "Jalapa, Mex.," was sent me by Prof. Wickham. The species was originally described from Oaxaca, Mexico, two specimens being all that were known.

The specimen at hand agrees in every way with the description with the exception that the sutural margins from the middle to apex are very narrowly bordered with black. The structure of the antennae is as in *inornata,* but the outer joints are even less dentate. The specimen is a female, hence the terminal segments of the abdomen furnish no characters of importance. The length of the specimen is 9.5 mm.

ENOCLERUS

Gahan, Ann. Mag. Nat. Hist. (8), v, 1910, p. 62 and 65. *Clerus* Schklg., Gen. Ins., Cleridae, 1903, p. 48 (nec. Fabr.).

The term *Enoclerus* proposed by Prof. Chas. J. Gahan for the American species formerly placed in *Clerus* is suppressed by Sigm. Schenkling in the Coleopterorum Catalogus (W. Junk), Cleridae, 1910, p. 51, and placed as a synonym of *Clerus* Fabr.

Prof. Gahan has, I think, plainly demonstrated that the type of the genus *Clerus* is the European *mutillarius* Fabr., a species not congeneric with the American species. Prof. Gahan used both the "first species" and "elimination" methods and both gave the same result. *Sexguttatus* Fabr., which must be accepted as the type of *Clerus,* if the classification of Mr. Schenkling be approved, was not included as one of the original species, apparently being unknown to Fabricius at the time he characterized the genus, the description of *sexguttatus* appearing in an appendix to the volume. *Mutillarius* was the last of the species originally included in *Clerus* by Fabricius to be removed to another genus. Jacques du Val in 1861 made it the type of his genus *Pseudoclerops*. Therefore there seems to be no other course than to consider *Pseudoclerops* a synonym of *Clerus* Fabr., and to retain the name *Enoclerus* for the American species.

Enoclerus ocreatus Horn, Trans. Amer. Ent. Soc., xii, 1885, p. 154.

Specimens of this species occur in Colorado in which the antennae and tibiae are quite dark; these specimens bear a great deal of resemblance to an immaculate *humeralis* Schaeff., but the elytra are slightly more depressed and the punctuation much less inclined to become seriate.

Enoclerus humeralis Schaeff., Sci. Bull. Brooklyn Inst. Mus., I. 1905, p. 155.

This species originally described from Tulare Co., California, appears to be confined to the Pacific coast region. In the collection of Mr. F. S. Daggett there is an example from San Bernardino Mts., California, elevation 6,400 ft. My friend, Mr. F. W. Nunenmacher, has recently sent me a specimen

from Del Norte Co., northern California, and from Prof. Wickham I have received a specimen for identification which is labeled Vernon, B. C. In all these, as in the type, the red humeral markings are strongly limited and of the same form.

Enoclerus quadriguttatus var. **rufiventris** Spin., Mon. Clér., I, 1844, p. 264, pl. xxiii, f. 3.

A specimen of this variety from Mt. Katahdin, Maine, 5,000 feet, sent for examination by Prof. Wickham has the usual coloration of this variety excepting that the apical margin of the prothorax is dull testaceous and the median elytral fascia is bright orange-yellow; a subapical fascia of the same color is less evident, being more thoroughly hidden by the dense grayish pubescence clothing this part.

Enoclerus bombycinus Chevr., Col. Mex., cent. I, fasc. 1, 1833, No. 42.

Three specimens from Tepehuanes, Durango, Mexico, sent by Prof. Wickham, are as variable in size as the examples from eastern Mexico, but remarkably constant in coloration.

Enoclerus spinolae Lec., Proc. Acad. Nat. Sci., Philad., vi, 1853, p. 230.

A specimen of this species taken by Prof. Wickham at Tepehuanes, Durango, Mexico, has the post median fascia nearly complete, the interruption at the suture being very narrow.

This species has on two or more occasions been recorded as occurring in Mexico, but no definite locality has been given.

Enoclerus acerbus sp. nov.

Closely allied to *ichneumoneus* Fabr., from which it differs as follows: Form broader and depressed, head and prothorax rather coarsely rugose, elytra very finely confluently punctate, the general color black, a broad median fascia and the abdomen yellow. Head, prothorax, base of elytra and legs clothed with long erect and semi-erect greyish hairs; these are wanting upon the disk of the prothorax where they are replaced by very short, dense black pubescence and longer black hairs. Elytra black, a broad median fascia yellow, the anterior and posterior margins of fascia sub-parallel but arcuate upon each elytron, the convexity being toward the base of elytra, a sub-apical oblique fascia composed of short greyish pubescence as in *ichneumoneus*,

the black portions clothed with short velvety black pubescence, and with the fascia with sparse long black hairs. Length 10 mm.

Elko, Nevada. Type in cabinet of Prof. Wickham.

A smaller specimen (8.2 mm.) which is not before me at the present time is in the collection of the Illinois State Laboratory of Natural History. This specimen is from the "Peabody colln." and bears the locality label "Ut." and the name label *analis,* from which it is entirely distinct.

Enoclerus opifex Gorh., Biol. Centr.-Amer., Col., iii, 2, 1882, p. 156, pl. viii, f. 3.

Two specimens of this interesting addition to our fauna were taken at Alpine, Texas (4400-6000 ft.) by Prof. Wickham. Gorham described *opifex* from Mexico, Guatemala and Nicaragua. It is quite unlike any other species in our fauna. The color is black, shining, the elytra red, a large rounded subapical black maculation on each elytron sometimes confluent at suture, the black bordered anteriorly by a narrow pale red fascia, the extreme apex is black and with the legs is densely clothed with gray hairs. The specimens before me are 7.5-8 mm. in length. Gorham gives the length of this species as 5.5-8 mm.

Enoclerus analis Lec., Ann. Lyc. Nat. Hist. N. Y., v, 1849, p. 20.

This appears to be a much misunderstood species, others than the proper species usually bearing this name in collections, while *analis* is as often placed under another name. I have even found them placed as *abruptus,* a species to which they bear but little resemblance. *Analis* is variable in regard to the coloration of the legs and abdomen, the elytra are on the contrary quite constant, being in all specimens examined red at base and dark before the median fascia which has a form not found in any other species occurring in North America, and which is somewhat similar to that of *rosmarus* but more deeply and regularly concave and greatly prolonged posteriorly at the suture, reaching nearly, or quite to the subapical fascia; the apex is black (pale in most specimens of *rosmarus*) and the black space intervening between the pale

fasciæ is much wider than in *rosmarus*. The legs are usually black, but the color varies to the extent of all the tibiæ red and in some individuals the anterior and sometimes a portion of all the femora as well as the tarsi are also red. The color of the abdomen as given in the original description and as given in the notes subjoined is contradictory, but as due to actual variation in color the statements are true; the abdomen varying from entirely pale red, the apical segment sanguineous red, to entirely black, usually, however, with the apical segment red. The specimens at hand show that the basal segments are the first to become darker, these having at times merely an infuscate cloud; the most common form has the three apical segments red.

Enoclerus abruptus Lec., Proc. Acad. Nat. Sci., Philad., 1858, p. 72.

This is undoubtedly the most variable species of the genus. The typical form has the head, thorax and legs red, but forms are at hand with the same parts black; in other specimens the head and thorax may be black, the legs red or again these conditions may be reversed. The basal maculations of the elytra are always present, but in some individuals they are but little paler than the basal portion of the elytra; the width and form of the median fascia is very variable, and is usually but not always interrupted at the suture. The color of the pale parts varies from red to yellow. It is probable that two or more of the species now standing as valid are but varieties of this species.

Enoclerus abruptus var. **coccineus** Schklg.

Clerus coccineus Schklg., Deutsch. Ent. Zeitschr., 1906, p. 272, pl. II, f. 7.

Clerus corallinus Fall. Trans. Amer. Ent. Soc., XXXIII, 1907, p. 240.

This is one of the many forms deserving of a varietal name. *Coccineus* was described from northern Mexico but occurs in our fauna from Duluth, Minn., through Nebraska and Colorado to Texas and New Mexico.

Enoclerus palmii Schaeff., Journ. N. Y. Ent. Soc., xi, 1904, p. 218.

This recently described species seems to be not rare in collections. It is in my collection from Las Vegas, New Mex., and Prof. Wickham has taken it at Gallup, New Mex., and at Williams, Ariz. There is some variation in size but the markings and sculpture are constant.

Hydnocera superba sp. nov.

Moderately robust, cyaneous, shining; head and thorax with slight greenish tint, the latter sometimes æneous; elytra violaceous; antennæ pale testaceous at base, gradually infuscated toward apex; legs blue black. Head including the eyes wider than the prothorax, very densely but not very coarsely punctate, front impressed each side of middle, clothed with short sparse whitish pubescence, with a few long erect black hairs intermixed. Thorax broader than long, densely, rather coarsely punctate, middle of disk at base impunctate; sides strongly constricted at apex, moderately dilated at middle and straight and parallel at base, lateral foveæ deep and distinct, pubescence greyish, short sparse and inconspicuous with a few long erect black hairs intermixed. Elytra normally covering the abdomen, feebly narrowing to apex; humeri distinct; surface coarsely, subcribrately punctate, the individual punctures mostly well separated, apical two-fifths more finely and densely punctate, becoming scabrous toward apex; apices obtusely separately rounded, non-serrate, slightly dehiscent at suture; clothed with short, recumbent greyish pubescence which is most conspicuous toward the apices and also forms an indistinct fascia at apical two-fifths, also with longer dark hairs which are erect before the fascia and semi-recumbent behind it. Body, abdomen and legs very finely and densely punctate, moderately clothed with whitish pubescence, the legs quite densely. Length 6 mm.

Two specimens. Tepehuanes, Durango, Mexico.

Type in collection of Prof. Wickham; cotype in my collection.

Hydnocera mexicana sp. nov.

Robust, æneous, moderately shining; antennæ (except club), tibiæ and tarsi rufo-testaceous, the tarsi more or less infuscate; abdomen black with cupreous reflexions. Head, including the eyes, distinctly wider than the prothorax, rather coarsely, very densely punctate, clothed with short, whitish, recumbent pubescence and longer sparse black pilosity. Thorax wider than long, discal area sparsely, the flanks coarsely and densely punctate; sides strongly dilated before the middle, strongly constricted near apex, feebly convergent at base; lateral

foveæ moderately distinct; pubescence and pilosity similar to that of head but more dense. Elytra scarcely shorter than the abdomen; flanks slightly convergent posteriorly; wider than the head; humeri distinct; disk feebly convex; coarsely, densely punctate, an area behind the post-median fascia confluently punctate, becoming granular at the apices; sparsely clothed with short, recumbent, whitish hairs, long erect black hairs conspicuous on basal half; a post-median transverse spot or fascia dull testaceous, clothed with long, recumbent, posteriorly directed whitish hairs, these also extending anteriorly on suture to about basal one-third, thence sinuately to the humeri, behind the fascia these hairs also evident, extending nearly half way to apices thence forming an arcuate fascia with its convexity toward the apices, the latter obtusely, separately rounded, non-serrate and dehiscent at suture. Body beneath and abdomen finely, sparsely punctate, clothed with moderately long, sparse hairs; legs clothed with short whitish and longer erect black hairs. Length 5.—5.5 mm.

This species bears a striking resemblance to the North American *subfasciata,* the size, color, general form and especially the markings being very similar. The upper surface more coarsely punctate throughout, the more distinctly marked elytral pattern with the post-median color fascia and non-serrate elytral apices render it impossible to consider it as other than a distinct species.

Two specimens. Tepehuanes, Durango, Mexico. Type in collection of Prof. Wickham; cotype in my collection.

Hydnocera bituberculata Chevr., Rev. Mag. Zool., 1874, p. 71.

A specimen of this graceful but oddly formed little species was taken at Jalapa, Mex., and sent me by Prof. Wickham. In the original description the color of elytra is given (by implication) as black, while in the *Var. B.* the prothorax and elytra are said to be blue. In the present specimen the head and prothorax are shining dark bluish green and the elytra are purplish black. The length is 4 millimeters, agreeing with the type in size. The basal tubercles of the elytra are quite conspicuous.

Ellipotoma laticornis Say.

Enoplium laticornis Say, Bost. Journ. Nat. Hist., I, 1835, p. 164.
Ellipotoma laticornis Wolc., Bull. Ind. Dep. Geol. Nat. Res., I. 1910, p. 859.

This species, which I have referred to the genus *Ellipotoma* Spinola, has the antennæ eight-jointed in the male, while in the female they are ten-jointed. *Ellipotoma* (*Apolopha*) *trilineata* Chevr. (Rev. Mag. Zool., 1874, p. 324) is very doubtfully distinct from *laticornis*. Our species is in any event better placed in *Ellipotoma* than in either *Apolopha* or *Ichnea*, I agree with the expressed view of Prof. Gahan that *Ellipotoma* should be removed from the group Hydnocerini and be placed near *Phylloboenus* in the group Enopliini of the subfamily Corynetinæ.

Eurycranus pulchellus sp. nov.

Elongate, bluish-green, shining; abdomen, femora and pronotum dark aeneous green, apical margin of the latter dark violaceous; eyes, antennæ, parts of the mouth (labrum, mandibles, palpi), tibiæ and tarsi black; prosternum and apical half of prothoracic flanks rufous; elytra brilliant green with slight metallic lustre and very shining. Head not wider than prothorax at apex, rather finely and densely punctate; eyes feebly convex; front biimpressed; clothed with short, sparse, whitish pubescence and long, moderately dense erect black pilosity; antennæ shorter than the head and thorax. Thorax distinctly wider than long, widest at basal third, base and apex sub-equal in width, subapical constriction feeble; sides broadly rounded; subapical transverse impressed line feeble; basal impressed line deep; a feeble fovea each side at middle; disk at middle longitudinally sulcate; surface coriaceous, rather coarsely and irregularly punctate; clothed with very sparse, recumbent whitish pubescence and long erect black pilosity. Elytra subparallel; apices conjointly rounded; rather strongly convex; humeri protuberant; a distinct post-humeral fovea; scutellar region depressed; coarsely, densely irregularly punctate at base, the sculpture becoming scabrous toward apex; entire lateral margin and apical two-thirds of sutural margin bicarinate; rather densely clothed with long, semi-recumbent, coarse, yellowish white pubescence with longer, erect black hairs intermixed. Body beneath moderately coarsely, sparsely punctate; legs finely, densely punctate. Venter and legs moderately clothed with yellowish white pubescence. Length 6 mm.

This is the second species of the genus to be made known from elsewhere than Chili, which country is the metropolis of the genus *Eurycranus*. Rev. Mr. Gorham (Biol. Centr.-Amer., Col. III, 2, p. 165) described a species from Guatemala, to which he gave the name *viridiaeneus*. The present

species differs from Gorham's species by having the prothorax broader than long (longer than wide in *viridiaeneus*); the mouth, antennæ and palpi black and the legs dark (these parts red in *viridiaeneus*) and the sculpture of the thorax and elytra is quite different.

One specimen. San Angel, D. F., Mexico.

Type in collection of Prof. Wickham.

PRIONOSTICHAEUS nom. nov.

The above term is here proposed to replace the generic name *Prionodera* Wolc., (Publ. Field Mus., Chicago, VII, 1910, p. 396) which I find is a homonym of *Prionodera* Chevr. (Dej. Cat. Col., 2nd ed., 1834), a genus of Chrysomelidae.

Three new Brazilian Micro-Lepidoptera.

By W. D. Kearfott, Montclair, N. J.

Anacrusis iheringi sp. n.

Exp. ♂ 25-26 mm., ♀ 28-30 mm.

Head and collar dark chocolate brown, mixed with black; face and palpi pale clay-yellow, speckled with dark brown; antennae clay-yellow, dark brown above; thorax, abdomen and legs, light clay-yellow.

Forewing ♂, pale clay-yellow, transversely finely strigulated with a darker shade, the strigulations forming faint costal dashes. On the outer half of wing, above middle is a long horizontal chocolate brown triangular streak, beginning at end of cell, its upper edge nearly reaches apex, but bends acutely downward toward middle of termen, the lower edge is broadly concave and below it is a cloud of brownish scales. This brown mark is bordered anteriorly by a broad and outwardly by a narrow silver white edging. In some specimens there is a tendency of the brown mark to become broken near its inner end. In the apex is a small white spot transversed by a narrow chocolate brown line. Cilia clay-yellow.

Hindwings light clay-yellow, with a few brown flecks in apex.

The ♀ is generally darker than the male. The triangular mark on forewing is replaced by a dot of brown at end of cell in middle of wing and half way between this dot and apex is a silvery white round spot, enclosing on its inner side a lunate spot of chocolate brown. Between these and reaching to costa the ground color is much darker, forming a quadrate costal spot.

The ♀ forewing is strongly incised between apex and middle of termen and below middle is strongly concave, in the ♂ the upper incision is much slighter and the lower half of termen is convex.

Described from one ♂ and two ♀'s from Sao Paulo, Brazil, from Dr. R. von Ihering, of the Museo Paulista, for whom the species is named (No. 10-650). Types in my collection.

Stenoma chlorina sp. n.

Exp. 24-27 mm.

Head sordid yellowish brown, face hoary white, palpi dark bronzy green with scattered white scales on upper side of both 2nd and 3rd joints; thorax light gray; abdomen light yellow, anal tuft ochreous; legs, ochreous, tarsi ringed with dark brown.

Forewing of a shining chlorina-green, the ♂ in certain lights and from certain angles, a lighter, whitish shade is visible, especially between upper edge of cell and costa, at end of cell and in a narrow terminal line. In the ♀ this white shade is permanent and parallels costa from extreme base to middle of termen; it is interrupted at middle of costa and sends a narrow curved spur to the dot at end of cell, and thence to hindmargin; it is somewhat speckled through its length by ground color; in the ♀ the terminal whitish line is much more distinct.

There is a dark brown, almost black, spot on the fold at two-fifths of wing length from base; at the end of cell is a more intense dot of the ground color, surrounded by whitish scales.

Hindwing dull ochreous brown, cilia clear yellow.

Described from six specimens from Dr. R. von Ihering, Sao Paulo, Brazil (No. 10-860); two in Meyrick's collection.

The forewings of this species are broader than the *schlaegeri* group, and more nearly the shape of *sciaphilina* Z.

Stenoma dissimilis sp. n.

Exp. ♂ 17-22 mm., ♀ 23-27 mm.

Head white, suffused with lavender gray in front, face white; palpi white, with an ochreous brown spot, above, at base of 2nd joint, a suffusion of the same shade in the middle of the terminal joint; thorax gray; abdomen whitish yellow.

Forewing, ground color, pure white; the lower half of wing bounded by fold is gray, with a pinkish-lavender suffusion, its upper edge is bordered above by four quadrate spots of a darker degree of the same shade, the dorsal margin from base to middle of this patch is dull gray;

between the outer end of patch and tornus are two flatly triangular indian red spots; from the outward one arises a curved transverse line of six gray dots, paralleling the termen. Above the patch, and connecting it to the costa, at inner sixth, is a broad fascia of light brown, containing a dark brown streak at its lower edge and inner side of the upper half.

The costa is washed with pale yellow, and there are small shades of this color and gray, between costa and dorsal patch, the most prominent is a yellowish gray spot at end of cell, near costa, below it a smaller and fainter spot, and beyond the latter is a curved mark of light gray. Between the row of sub-terminal dots and termen is a curved shade of yellowish gray.

Hindwing white, inwardly shading into ochreous-white.

♀ differs from male in the dorsal patch, which is heavily overlaid with blackish brown, especially on the outer half. The shades of ochreous, red and lavender are also entirely absent.

Described from seven ♂'s and five ♀'s from Dr. R. von Ihering, Sao Paulo, Brazil (No. 10-631).

This species belongs to the *schlaegeri* group, with narrow forewing. In the ♂ there is a distinct narrow dorsal fold or roll, and in this sex the scales of the basal patch are long and specialized.

A pair in Dr. Edward Meyrick's collection, and I gratefully acknowledge his kindness in comparing this and preceding species with British Museum collections.

Courtship in Tarantulas.—The instincts of the male tarantula change suddenly at the period of maturity. From a creature with domestic habits he develops into a vagabond. Disregarding personal danger he constructs a sperm-web into which he throws out his sperm and pumps it then into both of his palpi. In the search for the female he is entirely dependent upon his sense of touch, his sense of sight being entirely inadequate for the purpose. The courtship is therefore very short and consists in beating the female with his front legs. The danger of being hit by the fangs of the excited female is prevented by catching them with the hooks on the front legs. The coitus lasts not longer than one half minute, after which the spiders cautiously separate. A few weeks later the males die apparently a natural death.—Alexander Petrunkevitch.

Endaphis Kieff. in the Americas (Dipt.).

By E. P. Felt, Albany, N. Y.

The discovery of species referable to this genus from widely separated points in the New World is interesting. Last fall we received from Prof. C. H. T. Townsend, Piura, Peru, two specimens of a small midge reared by him from cotton leaves badly infested with galls containing mites. It is possible that these cotton leaves were also infested by small aphids, though none were observed. The North American species has also been reared. The two forms are characterized below.

Endaphis abdominalis n. sp.

Male. Length .25 mm. Antennae nearly as long as the body, thickly haired, yellowish; 14 segments, the first antennal segment greatly produced ventrally and probably dorsally, extending to the middle of the subglobose second antennal segment, the fifth binodose, the two parts of the stem, each with a length over twice its diameter, the enlargements subglobose, each with a thick subbasal whorl of long, stout setae and a well developed subapical circumfilum, the loops of the latter extending to the base of the succeeding enlargement. Palpi quadriarticulate, the first and second segments short, the third with a length about three times its diameter, the fourth as long as the third. Mesonotum fuscous, the submedian lines yellowish. Scutellum yellowish, postscutellum fuscous. Abdomen light yellow, fuscous basally. Genitalia yellowish. Wings hyaline, costa pale straw, subcosta uniting therewith at the basal third, the third vein distinctly before the apex, the fifth, indistinct distally, at the distal third. its branch near the basal third. Halteres yellowish transparent. Coxae and femora yellowish; tibiae fuscous yellowish, the tarsi, especially the distal segments, darker. Claws long, slender, evenly curved, simple, the pulvilli narrow, nearly as long as the claws. Genitalia indistinct.

Female. Length .3 mm. Antennae extending to the second abdominal segment, rather thickly haired, fuscous yellowish; 14 segments, the first antennal segment produced, the dorsal tooth extending to the middle of the subglobose second antennal segment, the fifth subsessile, cylindric, with a length about twice its diameter and thick subbasal and subapical whorls of long, stout setae; terminal segment broadly oval, with a length about ½ greater than its diameter, broadly rounded apically. Palpi probably as in the male. Mesonotum fuscous, the submedian lines yellowish. Scutellum yellowish, postscutellum fuscous. Abdomen yellowish, the basal three segments a variable fuscous. The

slender pulvilli nearly as long as the slender, curved, simple claws. Ovipositor short, the lobes narrowly oval, sparsely setose. Other characters as in the male. The colors are approximate, since the descriptions were drafted from balsam mounts.

Received through Dr. L. O. Howard, from Prof. C. H. T. Townsend, Piura, Peru, and numbered by him 7009. Easily distinguished from *E. perfidus* Kieff. by its much smaller size and the presumably yellow color of the abdomen.

Endaphis americana n. sp.

The first North American representative of this European genus was reared September 2, 1910, from what appeared to be galls of *Eriophyes fraxiniflora* Felt on *Fraxinus velutina* collected by Dr. R. E. Kunze, Prescott, Arizona, August 15th. There was no doubt as to the foliage having been deformed by *Eriophyes,* since mites were rather abundant and relatively large. There may have been a few aphids in addition.

Description. Female. Length 1 mm. Antennae extending to the second abdominal segment, yellowish transparent, slightly fuscous; 14 segments, the first excavated and with the margins produced dorsally and ventrally, the second subglobose, the third and fourth free, the fifth with a stem about ¼ the length of the cylindric basal enlargement, which latter has a length about 2½ times its diameter; subbasal and subapical whorls sparse; terminal segment slightly produced, with a length about 2½ times its diameter, broadly rounded apically; mouthparts slightly produced, having a length about 1.3 the diameter of the head. Palpi: first segment subquadrate, the second ½ longer, the third a little longer and broader than the second, the fourth a little longer and more dilated than the third; thorax and base of the abdomen dark fuscous yellowish, the latter yellowish white apically. Wings hyaline, the membrane rather thickly clothed with narrow, curved, hair-like scales; costa dark brown, subcosta uniting therewith near the basal third, the third vein at the distal fourth, the fifth before the distal third, its branch at the basal third. Halteres yellowish transparent. Legs whitish transparent, the distal tarsal segments slightly fuscous; claws slender, strongly curved, simple, the pulvilli nearly as long as the claws. Ovipositor when extended about 1-3 the length of the abdomen, the terminal lobes narrowly lanceolate, with a length about 2½ times the width and sparsely setose apically.

Type Cecid a2066, N. Y. State Museum.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., MARCH, 1911.

THE NOMENCLATURE QUESTION.

Dr. C. W. Stiles, Secretary of the International Commission on Zoological Nomenclature, has addressed a letter to the Editor of *Science,* published in the issue of that journal for January 20, 1911, on the subject of Special Committees for Zoological Nomenclature. He writes:

"The International Commission on Zoological Nomenclature is trying a plan of cooperation with international committees representing the various branches of zoology in an effort to determine in how far it will be possible to reach a unanimous agreement upon the names of the most important zoological genera, together with the type species of the genera in question.....The plan adopted is for the secretary to select three or more specialists of unquestioned international reputation in a given group, and to request these workers to add to their committee any colleagues whom they may desire. It is hoped that by this means preliminary studies of fundamental and permanent value may be conducted, and that the contending factions in respect to nomenclature, may be harmoniously united.

The secretary of the commission on nomenclature is adopting the plan of taking man as a center, first working out, so far as may be done unanimously, names to be adopted for the animals most intimately associated with man, and while the undertaking may require years of patient labor, it is hoped eventually to establish a list of not less than ten thousand generic names, agreed upon unanimously, first by the special committee, and then passed upon unanimously by the commission on nomenclature. It is hoped, further, that by this plan an immense number of useless synonyms can be unanimously agreed upon as such, and gradually eliminated from general zoological literature.

The scheme naturally depends upon the amount of cooperation on the part of the special committees, which will be formed as rapidly as the work will justify."

This seems to us a step in the right direction. To establish names by common consent and the sanction of a supreme international body, instead of by the ever uncertain appeal to priority, will do away with one of the chief reproaches to zoological work. We hope that entomologists will do their utmost to assist the Commission, so that our nomenclature will no longer speak a different language this morning from that which it uttered last night.

Notes and News

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Dr. E. P. Felt has reviewed the fifth volume (1910) of F. V. Theobald's Monograph of the Culicidae or Mosquitoes in *Science* for Jan. 27, 1911.

Mr. Francis E. Bond, a retired Philadelphia broker, accompanied by Mr. Stewardson Brown, botanist of the Academy of Natural Sciences, and Thomas F. Gillin, an amateur naturalist, are on their way to Venezuela, where they will devote at least four months to the collection of specimens for the museum of the Academy of Natural Sciences, of Philadelphia, and for the Philadelphia Zoological Garden. Although the expedition is for the purpose of enriching the collection at the museum and the Zoological Garden, the entire expense of the journey will be defrayed by Mr. Bond.

The scientific services of the United States Department of Agriculture are described by M. G. Severin (Conservator in the Royal Museum of Natural History at Brussels and Secretary General of the recent International Congress of Entomology in that city) in a paper of forty pages extracted from the *Bulletin de la Societe centrale forestiere de Belgique,* Brussels, 1910. His account of the history, organization and accomplishments of the department, in which the Bureau of Entomology occupies a prominent place, concludes: "Such is a very fragmentary view of the department whose activities are very popular in the United States. Not only that great country can pride itself on the fruitful work of the bureaus, but also the entire world owes it recognition for the great value of the scientific and economic works which it publishes, for these works contain information useful to all those concerned with the enrichment of national agricultural productions. Such labor satisfies the two principal conditions which science ought to fulfil; to understand the secrets of nature—pure science, and to become master of them—applied science."

NOTE ON THE MELOID-GENUS HORNIA, RILEY, AND ITS ALLIES.—[Apropos of Dr. Wellman's recent article in the NEWS for January, 1911, on a new species of *Hornia,* the following from Ent. Monthly Mag., XLVII, pp. 16, 17, London (Jan. 1911) is of interest.]—My friend, Manuel Martinez de la Escalera, during a visit to Horsell last week, showed me two living examples of a remarkable Sitarid he had just bred from pupæ found in the cells of an *Anthophora* in walls at Mogador, Morocco. This insect has recently been described by him as a new genus and species under the name *Allendesalazaria nymphoides* (Boletin Soc. Españ. Hist. Nat., 1910, pp. 379-382), but he was apparently unaware of the fact that there were two extremely closely allied known American forms. One of these latter, *Hornia minutipennis,* Riley, from Missouri, has simple tarsal claws, the other, *Leonia rileyi,* Dugès, from Mexico, has the tarsal claws armed with a very long tooth, and both insects also attack *Anthophora. Allendesalazaria* has the tarsal claws formed as in *Hornia,* and there can be little doubt that these two genera must be very closely related.*

The American insects have been very fully described and figured, and their habits noted in detail by Riley† and Dugès‡ respectively. Dugès placed them under a separate section (*Horniides*) of the Meloidæ, mainly on account of their minute elytra, and this arrangement was adopted by me when dealing with the Mexican forms (Biol. Centr.-Am., Coleopt., iv, 2, p. 370). The two genera, however, are very nearly related to *Sitaris,* which also attacks *Anthophora.* The American and Moroccan insects are recorded as having been found upon walls in the vicinity of the nests of these mason-bees, after the manner of our own *Sitaris muralis.* According to M. Escalera, the female of *A. nymphoides* does not leave the gallery of the bee. It would be interesting to compare *Hornia minutipennis* with the Moroccan *A. nymphoides,* but unfortunately this is not possible. I saw a co-type of *Leonia* in Paris many years ago, in the collection of A. Sallé. *Hornia* is known to me from description alone.—G. C. CHAMPION, Horsell, Woking: *December,* 1910.

*Since this note has been in type M. Escalera writes me as follows: *Allendesalazaria* is valid, and may be separated from *Hornia* by the following characters:

Scutellum cordiform; wings one-fifth shorter than the elytra; antennæ short (in the ♀ a little longer than the head, in the ♂ as long as the head and thorax together), the third joint longer than the others *Hornia,* Riley.

Scutellum transverse; wings wanting; antennæ longer (in the ♀ reaching the posterior border of the prothorax, in the ♂ extending considerably beyond it), the third joint not longer than the others *Allendesalazaria,* Esc.

† Trans. Acad. St. Louis, iii, p. 564, t. 5, figs. 13, *a—d* (1877).

‡ Insect Life, i, no. 7, pp. 211-213, figs. 47, *b—f* (1889).

Lord Avebury (Sir John Lubbock) has been elected a corresponding member of the Paris Academy of Sciences, in the section of anatomy and zoology.

Notes on the Life Histories of Tabanidae (Diptera).—On April 15, 1909, I found two larvae of *Tabanus,* under the bark of a soggy log lying in the water of a swamp, the surface of the log being an inch or two above the water. One died before I reached home, the other was put into a bottle with some wet dirt and rotten wood, and from this a male of *Tabanus trimaculatus* was bred on May 18 of same year. The larva that died and which was presumably the same species was preserved in alcohol. It measures 37 mm. in length and is white without markings.

Late in March of the same year while looking under stones in a small, clear woodland stream, I found another *Tabanus* larva under a stone, which was quite lively, and seemed thoroughly at home in the clear water. This I kept in a bottle with some wet leaves and practically forgot it. However, on May 18 it had transformed to a pupa, and thirteen days later, on May 31 a male of *Tabanus melanocerus* emerged from the pupa. The larva was approximately the same size as the *trimaculatus* larvae, and was like them, white without darker bands.

I have also on several occasions bred a third species of *Tabanus,* namely *T. fronto.* The larvae of this species occur in the soil of my garden, which is rather dry and right on the crest between two water sheds, the nearest permanent water being at least a quarter of a mile away. These larvae are white with pale brown transverse bands, and transform into pupae in June or July, and into flies some two or three weeks later. The earliest date on which an adult has emerged is July 4, which is also the earliest date on which I have seen the species in the field. Two larvae which I have in alcohol are yellower than the *trimaculatus* larva mentioned above, but show no trace of the pale brown bands which exist in life. The largest of these two measures 36 mm. long and was taken July 5, while the smaller one is 33 mm., taken on March 31. Both, as also the preserved *trimaculatus?* larva, are well, but not abnormally, extended. The only pupa which I have found of this species was under a stone in my back yard.

Although horseflies do not generally breed away from water, *T. fronto* seems to be an exception, as larvae have been taken in my garden in several different years, while the adults occur more commonly in my garden and in my house than any other species of the family, the flies quite frequently entering the house, while newly emerged specimens have been noted on a number of occasions. I sent detailed notes on this species to Prof. J. S. Hine some years ago, but do not think he has published anything on the subject as yet.—C. S. Brimley, Raleigh, N. C.

ORTHOPLEURA DAMICORNIS.—During July, 1909, at Craighead Station, I chopped a Buprestid larvae (Chrysobothrid?) from a dying limb of a pecan tree (*Hicorea pecan* Britt.) The larva was placed in its burrow and kept caged until it shriveled up and died. A few days later a small parasite emerged measuring about 6 or 7 mm. in length and subsequently grew in size to about 10 or 12 mm. It was observed as pupated on April 25, 1910, emerging an adult *Orthopleura damicornis* May 19, 1910. This insect was kindly determined for me by Mr. A. B. Wolcott of Field Museum, Chicago.—F. C. CRAIGHEAD, State College Pa.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings, Academy of Natural Sciences of Philadelphia. **2**—Transactions, American Entomological Society, Philadelphia. **4**—The Canadian Entomologist. **7**—U. S. Department of Agriculture, Bureau of Entomology. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **22**—Zoologischer Anzeiger, Leipzig. **35**—Annalen, Societe Entomologique de Belgique. **46**—Tijdschrift voor Entomologie, The Hague. **47**—The Zoologist, London. **50**—Proceedings, U. S. National Museum. **54**—Journal, Royal Horticultural Society, London. **67**—Entomologiske Tidskrift, Stockholm. **89**—Zoologische Jahrbucher, Jena. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **143**—Ohio Naturalist, Columbus. **148**—New York Agricultural Experiment Station, Geneva. **166**—Internationale Entomologische Zeitschrift, Guben. **181**—Guide to Nature, Sound Beach, Conn. **186**—Journal of Economic Biology, London. **187**—Jahrbucher des Nassauischen Vereins fur Naturkunde, Wiesbaden. **193**—Entomologische Blatter, Nurnberg. **216**—Entomologische Zeitschrift, Stuttgart. **238**—Anales, Sociedad Cientifica Argentina, Buenos Aires. **285**—Natur-Study Review, Urbana, Illinois. **305**—Deutsche Ento-

mologische National-Bibliothek, Berlin. **306**—Journal, College of Agriculture, Imperial University of Tokyo. **307**—Annales, Societe Linneene de Lyon (n. ser.). **308**—Bollettino, Societa di Naturalisti in Napoli. **309**—Verhandlungen des Naturhistorischen Vereins der preussischen Rheinlande und Westfalens, Bonn. **310**—L'Echange, Revue Linneene, Moulins. **311**—La Science au XXe Siecle, Paris. **312**—American Journal of Pharmacy. **313**—Bulletin of Entomological Research, London.

GENERAL SUBJECT. Anon.—Cinematographie du vol des Insectes, **311,** ix, No. 97, 3 pp. **Reinick, W. R.**—Insects destructive to books, **312,** 1910, 551-562. **Swinton, A. H.**—The vocal and instrumental music of insects, **47,** xv, 14-24. **Tragardh, I.**—Om Berlese's apparat for snabb och effektiv insamling of sma leddjur, **67,** xxxi, 35-38. **Tucker, E. S.**—Random notes on entomological field work, **4,** xliii, 22-32. **Xambeu, C.**—Moeurs et mètamorphoses des insectes. 16 Memoire, 3d fasc., **307,** lvii, 67-116.

APTERA AND NEUROPTERA. Bagnall, R. S.—Notes on some Thysanoptera, **35,** liv, 461-464. **Sasaki, C.**—On the life history of Trioza camphorae n. sp. of camphor tree and its injuries, **306,** ii, 277-286. **Van der Weele, H. W.**—Collections Zoologiques du Baron E. de Selys Longchamps. Catalogue systematique et descriptif. Megaloptera, Fasc. v, pt. 1, 93 pp.

ORTHOPTERA. Anon.—A Locustid injurious to man, **313,** i, 227. **Rehn & Hebard.**—Records of Georgia and Florida Orthoptera, with the descriptions of one new sp. and one new subsp., **1,** 1910, 585-589 (*). Preliminary studies of No. Carolina Orthoptera, **1,** 1910, 615-650.

HEMIPTERA. Crosby, C. R.—Notes on the life-history of two species of Capsidae, **4,** xliii, 17-20. **Osborn, H.**—Remarks on the genus Scaphoideus with a revised key and descriptions of new American species, **143,** xi, 249-260 (*). A n. sp. of Tinobregmus, **143,** xi, 261 (*). **Pierantoni, U.**—L'origine di alcuni organi d'Icerya purchasi e la simbiosi ereditaria, **308,** xxii, 147-150.

LEPIDOPTERA. Busck, A.—On the gall-making moths on Solidago and Aster, with description of two n. sp., **4,** xliii, 4-6 (*). **Chagnon, G.**—Lepidoptera taken at St. Fabien, Que., **4,** xliii, 1-3. **Coolidge, K. R.**—On the genus Mastor. G. & S., **4,** xliii, 6-8. **Courvoiser, Dr.**—Entdeckungsreisen und kritische Spaziergange ins Gebiet der Lycaeniden, **216,** xxiv, 59-60, 70-71, 77-79, 81-82, 88-89, 92-94, 99-101, 106-108, 112, 125-127, 131-132, 135-137, 141-142, 147-149, 156, 167-170, 175-177, 181-182, 185, 192, 196-214, 234-236. **Eltringham, H.**—African mimetic butterflies. Oxford at the Clarendon Press, 1910, 136 pp. **Fountaine, M. E.**—An autumn morning in the Alleghany Mountains, **9,** xliv, 14-15. **Frohawk, F. W.**—The

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Doings of Societies.

AMERICAN ENTOMOLOGICAL SOCIETY.

A meeting was held December 22nd, 1910. Dr. Philip P. Calvert, President in the chair. Ten persons present. The reports of the Treasurer, Curator and Librarian were read. This being the annual business meeting, the following officers for 1911 were duly elected:

President, Philip P. Calvert; *Vice-President,* Henry W. Wenzel; *Treasurer,* E. T. Cresson; *Recording Secretary,* Henry Skinner; *Corresponding Secretary,* E. T. Cresson, Jr.; *Curator,* Henry Skinner; *Librarian,* E. T. Cresson, Jr.; *Publication Committee,* E. T. Cresson, C. F. Seiss and B. H. Smith; *Executive Committee,* Philip Laurent, H. W. Wenzel and D. M. Castle; *Finance Committee,* J. W. McAllister, C. S. Welles and D. M. Castle.

HENRY SKINNER, *Secretary.*

ENTOMOLOGICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

A meeting was held December 22nd, 1910. Ten persons present. In the absence of the Director and Vice-Director, Dr. D. M. Castle presided. The annual reports of the officers were read. Mr. E. T. Cresson, Chairman of the Publication Committee, stated that on October 27th last he had received the resignation of Dr. Henry Skinner as Editor of ENTOMOLOGICAL NEWS and that it had been accepted with regret. Dr. Philip P. Calvert was elected Editor, E. T. Cresson, Jr., Associate Editor, Erich Daecke was elected a member of the Advisory Committee and Dr. Henry Skinner Editor Emeritus.

Dr. P. P. Calvert exhibited a larva and an adult of the Odonate genus *Cora* from Costa Rica, interesting as possessing tracheal gills along the ventral side of abdominal segments 2-7 of the larva. It is the first American species known to possess such gills, although Hagen in 1880 described larvae of the Oriental genera *Euphaea* and *Anisopleura* which have gills

similarly situated. Such gills are probably modified abdominal legs. The existence of such gills is held to indicate the descent of Odonata and Ephemerida from animals with abdominal legs.

The following were elected to serve as officers for the ensuing year:

Director, Philip Laurent; *Vice-Director,* H. W. Wenzel; *Treasurer,* E. T. Cresson; *Recorder,* Henry Skinner, *Secretary,* E. T. Cresson, Jr.; *Conservator,* Henry Skinner; *Publ. Committee,* E. T. Cresson and E. T. Cresson, Jr.

HENRY SKINNER, *Recorder.*

BROOKLYN ENTOMOLOGICAL SOCIETY.

The annual meeting at 55 Stuyvesant Ave., January 12, 1911, was attended by 22 members and four visitors. The officers, with the exception of the Librarian, were re-elected: *President,* Dr. John B. Smith, *Vice-President,* Geo. P. Engelhardt: *Treasurer,* Chris. E. Olsen; *Recording Secretary,* R. P. Dow; *Corresponding Secretary,* A. C. Weeks; *Curator,* Geo. Franck; *Librarian,* Silas C. Wheat; *Delegate to the New York Academy of Sciences,* John B. Smith.

A dinner is to be held some time during February by the Brooklyn, New York and Newark Entomological Societies.

Mr. William Wasmuth described the eggs of the genus *Catocala,* of which he has bred nearly all the local species. The eggs of *clonympha* and *nubilis* differ radically from the others, supporting the contention that these species belong to different genera. A number of species hibernate as pupae.

R. P. Dow, *Recording Secretary.*

NEWARK ENTOMOLOGICAL SOCIETY.

Meeting of September 11, 1910; thirteen members and two visitors, Messrs. Matausch, of Newark, N. J., and Bird, of Rye, N. Y., present.

Mr. Bird read a paper on "New York City's fifty-mile

faunal zone as relating to the Noctuid genus *Papaipema*." He dwelt chiefly upon the habits of the various species, and related his experience in discovering their life histories. To date he has worked out the life histories of all the known species in the area treated with the exception of two. The paper was illustrated by a box of specimens showing the seven new species he has discovered within the confines of New York City, together with their larvæ, pupæ and parasites, and samples of their work in the plants into which they respectively bore.

Mr. Buchholz reported the capture, at Lakehurst, of *Catocala similis* June 24 and July 10, *Hyperaeschra georgica,* May 30, and *Acronycta tritona,* May 30, July 10 and Sept. 3. He remarked that the latter was apparently triple brooded. *Catocala similis* larvæ were not rare on a species of scrub oak, all the larvæ collected producing very dark specimens of the adults.

Meeting of October 9, 1910; nineteen members and two visitors, Messrs. Beutenmüller and Matausch, present.

Mr. Beutenmüller exhibited a small box of *Catocalae* on which he commented as follows:

C. judith he had previously made a synonym of *C. orba* of Russia on the strength of Strecker's excellent figure of the upper side, the two, as he pointed out, being identical above. Upon the receipt of a specimen of the former species, however, he discovered them to be very different beneath and on structural characters proved to belong to different sections of the genus, *orba* falling in with the *ultronia* group while *judith* associates with the members of the *robinsonii* group. From Texas he received a dark form of *C. jair* which he said may be passing current as *C. amica. C. beutenmulleri* B. & McD., recently described, is the male of *C. warneri* Poling.

Mr. Buchholz said that the specimen of *Catocala jair* taken by him at Lakehurst and reported at the April meeting of the Society, was an example of the dark varietal form shown by Mr. Beutenmüller.

Mr. Kearfott spoke at some length on the methods employed in capturing, rearing and preparing Micro-lepidoptera and of the magnitude of the field for the ardent worker. As an illustration of what might be done anywhere he said that in New Jersey, the insect fauna of which is better known than that of any other State, over 50 per cent. of the species recorded during the past ten years were new to the State, and that eventually the present number of species known from that region—about 1500—will be increased to 3000.

Micro-lepidoptera in general are very easily bred. The larvae are simply collected and placed in small screw-top vials in which the food keeps fresh from ten days to two weeks. In that period of time most micro-lepidoptera, if not too small when collected, will have reached the pupal stage. Occasionally mould sets in; but this is unusual, and when it occurs the screw-top should be removed and a bit of cheese cloth substituted.

All breeding notes may be put on 8x10 cards and filed away, the name of the species being added when obtained.

Very interesting in their life history are certain species of Micropterygidae which were discovered mining in the leaves of oak, birch and chestnut. The larvæ cause blotches on the leaves as large as a silver dollar. They become full grown in about ten days when they drop to the ground and remain as larvæ until the following April when the pupal condition is assumed. Beyond this stage the species were not reared, the group determination being made by the pupæ which show the peculiar long folded maxillary palpi.

Equally interesting are the species of *Nymphula* which have been bred by Dr. W. T. M. Forbes. The larval life is spent beneath the surface of the water and tracheal gills are developed, though functionless spiracles are present as well.

All Micro-lepidoptera are best captured as adults in the evening just after sundown. Mr. Kearfott has taken between 200 and 300 specimens representing dozens of species in a space fifty feet square at this time of day.

The condition of the white birch forests of Vermont, Massachusetts, and to some extent, Maine, is serious as a result of the attacks of a species of *Bucculatrix* which causes them to appear as if swept by fire. The minute larvae between one-fourth and three-eighths inch in length are at first leaf miners, but later come outside to feed. Three to six larvae were on each leaf and every leaf on each tree was infested. By estimate there were about 100,000 examples to a tree. *Betula lenta* was also sparsely attacked but only where there was a dearth of white birches.

Mr. Brehme reported the occurrence of *Catopsila eubule* at Beach Haven, Ocean Co., on Sept. 27 and the capture of a perfectly fresh example of *Argynnis idalia* at Fairton, N. J. on Sept. 16.

Meeting in Turn Hall, on November 13, 1910; fourteen members present.

Mr. Buchholz showed two boxes of *Catocala gracilis* and *similis* which were taken by himself and Mr. Keller at Lakehurst. He also reported *Glea tremula, G. viatica* and *G. sericea* from the same locality on Sept. 25, and *Caripeta angustiorata* on May 30. He took a specimen of *Papaipema duavata* Bird, at Elizabeth, and *P. stenocelis* Dyar, a species recently described from Virginia, at Lakehurst.

Mr. Brehme made a few remarks on the Periodical Cicada which is due to appear in New Jersey in 1911. He said the towers which are usually constructed by the pupae in moist situations were extremely abundant in Cape May Co. at the present time (Nov. 13, 1910). Millions of them from one to three inches high were erected in moist and in absolutely dry places. An attempt was made to secure some of the pupae by digging into the ground, but apparently they had retreated to a considerable depth as none could be found even two and a half feet below the surface.

Mr. Lemmer said he took a specimen of *Acronycta clizabeti* at Irvington, N. J.

Mr. Grossbeck exhibited a specimen of the rare *Sphinx franckii* from Johnson City, Tennessee.

Meeting in Turn Hall, December 11, 1910; ten members and one visitor, Mr. Matausch, present.

Mr. Brehme exhibited a box of *Hemileuca*, showing in small series all but three of the North American species.

Mr. Matausch spoke concerning the Membracidae and showed many enlarged water color sketches of both nymphs and adults. He outlined his experience in breeding *Ceresa taurina* and *Campylenchia curvata*. Moulting always takes place, so far as his observations went, in the early morning hours and the full coloration of the individuals in attained in about two hours after moulting. The fact that he has repeatedly found skins of young nymphs on the same twig as the fully grown individual indicates that the entire nymphal life is passed on one stem.

Ants frequently attend membracids and particularly the young nymphs. He has observed three species attending *Vanduzia arcuata* and stated that some species of membracids are preferred to others. A few species apparently have no ant attendants at all. Among the species that were bred from nymphs by Mr. Matausch were *Ceresa palmeri* which occurs on sweet gum, *Carynota mera* which feeds on black oak and a species of *Cyrtolobus* which developed on oak.

The officers elected for the ensuing year were as follows: *President,* Otto Buchholz; *Vice-President,* F. Lemmer; *Secretary,* H. H. Brehme; *Financial Secretary,* T. D. Mayfield; *Treasurer,* Geo. J. Keller; *Librarian,* Wm. H. Broadwell.

JOHN A. GROSSBECK, *Secretary.*

Meeting at the Newark Turn Hall, Sunday, January 8, 1911, seventeen members present, President Buchholz in the chair.

Mr. Grossbeck was appointed a Committee of one to represent the Newark Society in arranging for a supper and meeting of Entomologists with the New York and Brooklyn Societies. Mr. Kearfott's invitation to have the Society meet and look over his collection of Micro-lepidoptera on February 12th was accepted.

Mr. Buchholz exhibited a very interesting series of *Pseudo-*

hazis eglanterina, nuttalli, shastaensis and *denudata* which brought forth a lengthy discussion between Messrs. Angelman Franck and Prof. Smith, about the geographical range and variations of these species.

Mr. Franck stated that he has received a large number of *Hyperchiria incarnata* from the northern border of Mexico, which comes so close to *H. pamina* that he thinks it is only a dark form of *pamina* and that *pamina* is a geographical form of *incarnata.*

Prof. Smith gave a very interesting talk on Entomology in Europe. He spoke on what he learned on his recent trip to Germany, Holland and Belgium where he went for the interest of the American Nurserymen to protect them from further importation of destructive insects, and to find out under what conditions *Azolla* grows. Prof. Smith said that all nursery stock that is shipped into Germany is closely inspected and the least trace of scale or other insects is sufficient to condemn the entire shipment, and the man to whom it is addressed is notified and his choice is given to send it to some other State or have it destroyed. On the other hand no attention is given to stock which leaves Germany, no matter how bad the same may be infested, and therefore a constant watch has to be kept on nursery stock imported from European countries into the United States to prevent further importation of destructive insects.

The *Azolla,* which was to be introduced into New Jersey to plant out in pools, ponds, etc., to prevent mosquitoes breeding, will be of no use in New Jersey, as it will not grow on salt marshes and cannot survive our cold winters.

About five hundred specimens were donated by members for the new cabinets.

HERMAN H. BREHME, *Secretary.*

Erratum: Line 20 from top of page 55 (February NEWS) should read: stomach (Pl. II, figs. 17, 19, *lpgt*). The rectum has four tracheae, two

EXCHANGES.

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☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Micro-Coleoptera—Isaac B. Ericson, Molndal, Sweden, is working up the Micro-Coleoptera of the world and desires to exchange specimens.—G. A. Akerlind, 664 Monadnock Block, Chicago, Illinois, will act as intermediary if desired.

Wanted—In the spring or early summer, four live female *Anosia plexippus* to be posted to England, liberal prices paid.—Kindly apply to Hon. N. Charles Rothschild, Arundel House, Kensington Palace Gardens, London, W.

Will purchase Cicindelae in series of the more common forms from all over the United States. Dates and localities necessary.—E. D. Harris, 280 Broadway, New York.

Butterflies—I will name **spread** North American butterflies. Many rare species for exchange.—Dr. Henry Skinner, Logan Square, Philadelphia, Penna.

Wanted—Specimens of the Coccid genus *Lepidosaphes* (formerly *Mytilaspis*) for study. Will name and return.—H. T. Fernald, Amherst, Mass.

Japanese Butterflies and others. *Papilio, Charaxes, Hestinia, Euripus*, Saturnids, Sphingids from Formosa. Wanted Butterflies from any part of the world, especially tropical region.—T. Fukai, Konosu, Saitama, Japan.

Cocoons and chrysalids of *C. promethea* and *P. troilus* for exchange for Lepidoptera in papers --Edwin P. Meiners, 2624 N. Garrison Ave., St. Louis, Mo.

Catocalae and other Lepidoptera. Eggs of *innubens, cara, amatrix, ilia, piatrix* and hickory feeders. Also pupae of *regalis, imperialis, luna, modesta* and *P. ajax, troilus* and *cresphontes*.—H. A. Davenport, R. D. No. 3, Louisiana, Mo.

Lepidoptera for exchange from 1910, on pins, all named; also pupae of *cresphontes, troilus, turnus* for others.—F. Mulkmus, 3735 Cottage Ave., St. Louis, Mo.

Wanted—Elateridae and Buprestidae for other named Coleoptera. I also desire to exchange entomological bulletins of the various Experiment Stations for others not in my library, and for bulletins on plant pathology. Send lists.—C. O. Houghton, Delaware College, Newark, Delaware.

Lepidoptera on pins from this locality for exchange.—Ernst Frensch, Box 622, Stonington, Conn.

Cocoons of *Philosamia cynthia* to exchange for other pupae or Lepidoptera in papers —John H. West, 2229 N. Mascher St.

Will sell for cash a complete set of Illinois Geological Reports, or will exchange for technical entomological writings; those dealing with parasitic insects preferred.—J. E. Hallinen, Interlaken School, Laporte, Indiana.

For Sale or Exchange—Living pupae of *A. luna* and *A. ajax;* also adults of *Anthocharis pima* and *sara*, both perfect and second.—N. Weil, Calhoun, McLean Co., Kentucky.

Wanted For Cash—Can Ent., Vol. xxx, xxxi; Riley's First Missouri Report and other papers on North American entomology not in my library. Send lists.—W. Beutenmuller, Am. Mus. Nat. Hist., New York, N. Y.

Wanted—Bibliography of Economic Entomology, Part 6; Div. of Entomology, New Series, Bull. No. 15; Technical Bulletin 1; Old Series, Bulls. 1, 2, 4, 5, 8, 9, 10, 11, 12, 13, 18, 20, 26, 28, 30 and 33. Will pay cash or exchange.—Charles W. Hooker, Bureau of Ent., Washington, D. C.

Wanted—Correspondence with collectors of Lepidoptera desiring to take a trip of from 1 to 2 years in Malay Archipelago, or following the course of Amazon River in Brazil.—A. F. Porter, Decorah, Iowa.

Wanted—Living eggs of tent caterpillars (*Malacosoma* spp.) from the western United States. Kindly indicate food plant. Exchange or cash.—C. R. Crosby, 43 East Ave., Ithaca, N. Y.

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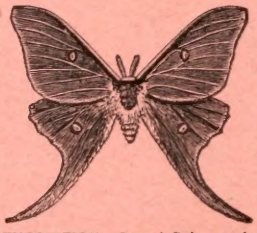

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